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Robust Stabilizing Digital Rocket Control

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Abstract

A digital rocket control technique is presented in this paper. A practical rocket ascending state model illustrates the control method. Linearization and A/D state transformation are applied to deal with the nonlinear continuous state model to the linear derivation discrete state model. The optimal control feedback and the optimal cost of the derivation variables are found based on the linearized discrete state model by constraining to the LQ performance index. Moreover, the robust stabilizing optimal feedback gain is found to stabilize the system and minimize the performance index.

Key words: Rocket; Flight control; Robust stabilization;
Optimal control; Digital

強健穩定式數位火箭控制

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摘要

這篇文章提出數位火箭控制的方法與分析。並用以一個實際上升的火箭狀態模組來展現這個方法。線性化和類比/數位之狀態轉換將被用來處理非線性連續系統之狀態模組成為線性數位化之狀態模組。基於這個模組，最佳化回授和最少的控制成本亦將被找出。再者，此回授亦可用來穩定整個系統。

關鍵字：火箭;飛行控制;強健穩定性;最佳化控制;數位